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AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHO--ETC F/G 14/1
AN ATTITUDINAL SURVEY OF DOD PROGRAM MANAGERS, CONTRACTING OFFI--ETC(U)
SEP 78 M A COOK , M L SHELDON
AFIT-LSSR-2-788

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Table 33

Additional Program Position Comparisons
(Kruskal-Wallis One-Way Analysis of Variance)

	Program Manager/ Deputy Mean Rank (N = 47)	Contracting Officer Mean Rank (N = 46)	Engineer Mean Rank (N = 55)	Chi Square (corrected for ties)	Probability (2-tailed)
Variable 11: ("Contractors' shares . . . too high.")	70.9	88.5	64.4	9.38	.0092
Variable 16: (". . . clauses . . . too com- plex.")	75.3	61.3	83.7	7.23	.0269
Variable 30: ("I understand the basic pur- pose . . .")	85.8	60.0	75.7	10.11	.0064
Variable 31: ("I understand the general mechanics . . .")	82.3	57.6	80.7	11.08	.0039

Table 34

Additional Service Comparisons
(Kruskal-Wallis One-Way Analysis of Variance)

	Air Force N=50	Navy N=42	Chi Square (corrected for ties)	Significance
Variable 18: ("Contractor employees do not know enough about the clauses")	Mean Rank	Mean Rank		
	89.2	64.0	10.59	.0050
Variable 19: (" . . . VE clauses cost more than they produce in savings.")	Mean Rank	Mean Rank		
	80.4	54.6	9.73	.0077
Variable 27: (" . . . budgeting for VE will increase effective- ness")	Mean Rank	Mean Rank		
	66.5	75.0	5.82	.0546*
Variable 28: ("Increase . . . VE staff")	Mean Rank	Mean Rank		
	70.4	92.0	9.73	.0077

* .05 when rounded to two digits.

Analysis

Negative Implications

The attitudes expressed by the respondents have both positive and negative implications for the successful implementation of the Value Engineering clauses. The respondents agreed to some degree that contractors receive VECP payments though overall performance is poor, and hold back cost saving ideas to gain later VECP shares. These views may be accurate perceptions of contractor practices or they may represent prejudices. In either case, a problem exists. Support for VE must be decreased to some extent by these attitudes. The respondents believe that contractors should provide reimbursements for VECP's that fail and that their shares should be dependent on overall contract performance. Five additional comments from respondents were categorized as expressing belief that contractors make unfair gains through VECP's (Appendix C). Thus, there is some support for the perception noted in Chapter 2 that VE is seen by some people as a scheme to unjustifiably enhance contractor profits (4:10).

Changing the clauses to provide for refunds and variable shares would conflict with two other problems that the respondents agree exist: clause complexity and difficulty of processing and administering VECP's. The clauses would become more complex and it would become much harder

to administer VECP's if the clauses were changed to include refunding and variable shares. Contractors' motivation to submit VECP's would be reduced.

Another problem for effective implementation of the VE clauses is the possibility that VE conflicts with other cost control concepts such as design-to-cost and life cycle cost (LCC). Variable 20 measured a similar concept, but it was phrased in terms of LCC and reliability improvement warranties decreasing contractors' motivation to submit VECP's. Contractors might be highly motivated to submit VECP's. However, these VECP's may not fit well with the goals of other contractual requirements. Of the 36 written comments by the respondents not pertaining to one of the variables already on the questionnaire, nine were categorized as expressing the belief that VE conflicts with LCC or other cost reduction programs (Appendix C). These added comments match the conclusions of the Rand study noted in Chapter 2 that the VE clauses do conflict with the requirements of other cost savings programs (1:14).

The questionnaire did not include a variable expressing the idea that government employees evaluate contractors' VECP's fairly. Eight of the respondents' written comments indicated belief that government employees hinder VE through unfair evaluation of VECP's or are otherwise too suspicious of contractors.

Positive Implications

Other findings have positive implications for the effective implementation of value engineering. There is mild agreement that the clauses produce cost savings and produce associated benefits. Respondents agree that they understand the basic purpose and general mechanics of the clauses. They apparently believe that current sharing arrangements are fair. They are essentially neutral to the concepts that approved changes often do not work in practice, that contractors use VECP's to cover up deficiencies, and that VE clauses cost more than they produce in savings. These findings do not support the idea noted in the literature review that VE may have negative connotations for most people (1:4; 9:1). The finding that there is no practical difference among program managers', contracting officers', and engineers' attitudes has positive implications. No particular program position group has negative attitudes that would hinder effective implementation of the VE clauses.

Recommendation

No definite detailed recommendations leading to improvement of VE clause effectiveness can be deduced from the mixed findings of this research. One recommendation for improvement, however, does fit with the outcome of the research. VE training could be performed within the program

offices, with the program managers participating in some sessions. The attitudes of the contracting officers and engineers might then begin to match those of the program managers. Training within program offices could be tailored to the needs of the specific system to overcome two of the negative findings reported herein: no relation between VE education and attitudes and a perception that VE is not sufficiently integrated with other program requirements. A training program in an Air Force program office similar to the one suggested was effective in producing more positive attitudes toward the VE clauses; and much more important, added VECP savings (14).

Finally, three respondents commented on the need for continued high level, DoD visible emphasis on VE. Continued high level support would eliminate the possibility that VE could be perceived as a fad by government or industry personnel.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the conclusions and recommendations of this research effort. A summary of significant findings will be related to the six objectives and relevant conclusions drawn. This final chapter, as well as the thesis, will be completed with recommendations for further research for the Value Engineering program.

Objectives and Findings

Objectives One, Two, and Three

The first three research objectives were to find out what aspects of VE clauses are perceived by program managers, contracting officers, and engineers, respectively, as advantages and disadvantages to their effective implementation. In terms of advantages, each of the three groups slightly agreed that VE clauses removed costly requirements, and that VECF's have associated benefits, such as improved reliability, maintainability, and producibility. However, they slightly disagreed that VE clauses are a good means of helping to control cost growth.

In terms of disadvantages, each of the three groups moderately agreed that contractors can receive VECP payments, even though performance is poor, and that VECP's are difficult to price, process, and administer. There was slight agreement by all of the respondents that: (1) contractors hold back cost savings; (2) their shares are too high; (3) the VE clauses are too complex; and (4) government and contractor employees do not know enough about VE. The three groups were neutral on the issues of (1) approved changes not working in practice; (2) the potential for contractors covering up deficiencies; (3) VE changes possibly costing more to implement than they save; and (4) life cycle costing, reliability improvement warranties, and incentive contracts reducing contractors' motivation to participate in an active VE effort. Finally, they slightly disagreed that contractors' shares are too high.

Objective Four

The fourth objective of the study was to find what, if any, statistically significant differences exist among program managers, contracting officers, and engineers regarding various aspects of VE clauses. It was found that there are no significant differences among these positions for any of the variables.

Objective Five

The fifth objective was to determine what, if any, statistically differences exist among the Departments of the Army, Air Force, and Navy personnel regarding various aspects of VE clauses. The survey results indicated that there was a significant difference of Navy personnel surveyed compared to those assigned to the Army and Air Force. Navy program managers, contracting officers, and engineers were less favorable in their perceptions of VE advantages.

Objective Six

Finally, objective six was to determine what significant correlations exist between the attitudes of program managers and those of contracting officers and engineers on various aspects of VE clauses across program offices. It was found that there is no correlation for any variable comparing the views of program managers to those of personnel in the two other program positions.

Corollary Findings

The survey participants perceived the difficulty of processing, pricing, and administering VECP's as the most serious problem among those listed in the survey. The respondents also recommended tying savings to contractors' shares as the most beneficial improvement to VE among the alternatives listed.

When the criterion test of at least two statistically significant differences among groups in a category (advantages, potential problems, suggestions for improvement) was applied to Kruskal-Wallis analyses for groups formed by VE education and VE experience classifications, the outcome was that the test was not met in any of the cases. Thus, it was concluded that VE education and experience, as measured in the questionnaire, did not affect attitudes systematically.

Recommendations for Further Research

1. A survey of other acquisition activities would extend the scope of knowledge of attitudes toward the VE clauses beyond the major programs covered by this thesis. Smaller programs and activities responsible for maintenance and overhaul of existing systems, such as the Air Logistics Centers, also provide opportunities for VE savings. It cannot be assumed that attitudes of personnel in these functions match those of the population examined herein.

2. Another survey of the major program personnel could be performed approximately one year after implementation of the revised Defense Acquisition Regulation if the VE clause complexity is in fact reduced or efforts are made to further integrate VE with other programs such as Design to Cost. The current thesis data would provide a baseline

for evaluation of the success of such changes in reducing resistance to VE.

3. The survey questionnaire should be revised to delete Variable 24 on the size of contractors' shares and Variable 30 on the individual's personal understanding of the VE clauses. At least one variable should be added to express the concept that VE conflicts with other cost reduction concepts. A variable should be added to learn whether there is a perception that other government employees evaluate contractors' VECP efforts fairly.

4. Future research should investigate attitudes toward expanding the use of recognition as a means of motivation for insured participation in the VE program.

APPENDIX A
SURVEY COVER LETTER AND QUESTIONNAIRE



RESEARCH AND
ENGINEERING

OFFICE OF THE UNDER SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

6 July 1978

TO:

SUBJECT: Value Engineering Clause Survey

The purpose of the attached questionnaire is to acquire data concerning the perception of Value Engineering Clauses by DoD Program Managers, Contracting Officers, and Project Engineers. It is hoped that an analysis of the survey results will lead to many positive recommendations to improve the content and implementation of Value Engineering contract clauses. Analysis indicates that it would be possible to greatly increase savings from use of these clauses.

You are requested to complete one questionnaire and to distribute the remaining questionnaires with attached return envelopes to any two contracting officers and to any two program project engineers within your program office. Responses to the questionnaire will be held confidential. Completed questionnaires should be mailed directly to the Survey Research team who will have sole access to individual responses.

Due to a time constraint on the research effort all distributed questionnaires should be mailed to the Survey Team within one week of receipt. Your cooperation in helping this research effort will be greatly appreciated. This survey is assigned RCS No. DD-DR&E(OT)-7824.

MAIL COMPLETED SURVEYS

TO:

AFIT/LSG (Cook/Sheldon, 78B)
Wright-Patterson AFB OH 45433

FLOYD H. TROGDON
Director, Office of
Materiel Acquisition Policy

VALUE ENGINEERING SURVEY INSTRUCTIONS

The purpose of this questionnaire is to acquire data concerning the perceptions of Value Engineering by Program Managers, Contracting Officers, and Program Engineers. It is hoped that an analysis of the survey results will lead toward many positive recommendations concerning better implementation of Value Engineering clauses.

You are requested to complete the questionnaire and mail it in the attached envelope. It should require 15 minutes or less to complete. Responses to the questionnaire will be held confidential. Completed questionnaires will be mailed directly to the survey research team who will have sole access to individual responses.

Due to a time constraint on the research effort, all distributed questionnaires should be mailed to the survey team within one week of receipt. Your cooperation in assisting this research effort will be greatly appreciated.

USAF SCN 78-141 (expires 30 Sep 78)

PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974,

a. Authority:

- (1) 5 U.S.C. 301, Departmental Regulations, and/or
- (2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or
- (3) DoD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or
- (4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DoD.

c. Routine uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

Demographic Data

1. How long have you worked in your current position?

2. Military or civilian: What is your rank/grade?

Col/GS-15 LC/GS-14 Maj/GS-13 Capt/GS-12 Lt/GS-11
or lower

3. What is your position title?

Program/Project Contracting Engineer
Manager or Officer
Deputy

4. Have you had any experience* with Value Engineering (VE)?

*Experience is defined as any direct involvement with a contract in which the contractor had an active VE program or submitted at least one VECP.

None More than one Four or more
contract but contracts
less than four

5. If you have had any experience with VE please categorize it on the following scale:

Very Favorable Neutral or Unfavor- Very Un-
Favorable Undecided able favorable

6. Have you received any VE education/training?

None One thru Five thru Nine thru 17 or more
four hours eight 16 hours hours
hours

Please express your agreement or disagreement with the following statements on a range of:

<u>Strongly</u> Agree SA	<u>Agree</u> A	<u>Agree</u> Slightly AS	<u>Neutral</u> or Undecided N/U	<u>Disagree</u> Slightly DS	<u>Disagree</u> D	<u>Strongly</u> Disagree SD
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Advantages

7. VE clauses help identify and remove unnecessary costly requirements.

<u>SA</u>	<u>A</u>	<u>AS</u>	<u>N/U</u>	<u>DS</u>	<u>D</u>	<u>SD</u>
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8. Value Engineering Change Proposals (VECPs) have associated benefits such as improved reliability, maintainability, and producibility.

<u>SA</u>	<u>A</u>	<u>AS</u>	<u>N/U</u>	<u>DS</u>	<u>D</u>	<u>SD</u>
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9. VE clauses are a good means of helping to control cost growth.

<u>SA</u>	<u>A</u>	<u>AS</u>	<u>N/U</u>	<u>DS</u>	<u>D</u>	<u>SD</u>
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Potential Problems

10. Contractors can receive significant VECP payments even though overall contract performance is poor.

<u>SA</u>	<u>A</u>	<u>AS</u>	<u>N/U</u>	<u>DS</u>	<u>D</u>	<u>SD</u>
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11. Contractors' shares under the clauses are too high.

<u>SA</u>	<u>A</u>	<u>AS</u>	<u>N/U</u>	<u>DS</u>	<u>D</u>	<u>SD</u>
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12. Contractors hold back ideas for cost reduction until production to obtain a greater share.

SA A AS N/U DS D SD

13. Approved changes often do not work in practice.

SA A AS N/U DS D SD

14. VECs are difficult to process, to price, and to administer.

SA A AS N/U DS D SD

15. Contractors submit VECs to cover up contract performance deficiencies.

SA A AS N/U DS D SD

16. VE clauses are too complex.

SA A AS N/U DS D SD

17. Government employees do not know enough about VE to implement the clauses effectively.

SA A AS N/U DS D SD

18. Contractor employees do not know enough about VE to implement the clauses effectively.

SA A AS N/U DS D SD

19. On the whole, the VE clauses cost the DoD more than they produce in savings.

SA A AS N/U DS D SD

20. Life cycle costing, reliability improvement warranties, and incentive contracts reduce contractor's motivation to participate in an active VE effort.

SA A AS N/U DS D SD

21. If you are aware of any problems not covered in Questions 10 through 20, please write them in the following space:

22. What are the two most important problems as listed in Questions 10 through 20? Write their question numbers in the spaces following:

<u>Question</u>	<u>Question</u>
<u>Number</u>	<u>Number</u>

Suggestions for Improvement

23. Contractors should be paid to do VE work directly and their shares should be reduced.

SA A AS N/U DS D SD

24. Contractors' shares in VE savings should be increased.

SA A AS N/U DS D SD

25. Contractors' shares in VE savings should be dependent on overall performance; i.e., higher shares for better performance.

SA A AS N/U DS D SD

26. Contractors should be required to reimburse the Government for extra costs generated when a VECP fails to work.

SA A AS N/U DS D SD

27. The new requirement for budgeting for VE will increase the effectiveness of the VE program.

SA A AS N/U DS D SD

28. Increase the number of full time VE staff personnel.

SA A AS N/U DS D SD

29. What are the two most important suggestions for improvements as listed in Questions 23 through 28?

Question Number

Question Number

VE Knowledge

30. I understand the basic purpose of the Value Engineering clauses fully.

SA A AS N/U DS D SD

31. I understand the general mechanics of the clauses very well.

SA A AS N/U DS D SD

APPENDIX B
PROGRAM OFFICES SURVEYED

ARMY PROGRAMS

Advance Attack Helicopter
Army Gun Air Defense Systems
Army Tactical Data Systems
Black Hawk
Copperhead
Fighting Vehicle Armament
Fighting Vehicle Systems
Cannon Launched Guided Projectile
General Support Rocket Systems
Multiservice Communication System
Hellfire
Lance
Patriot
Stinger
Tow-Dragon
US Roland
XM-1 Tank System
Ch-47 Modernization
Firefinder

AIR FORCE PROGRAMS

F-15
F-16
A-10
E-3A
E-4A
Improved Sidewinder
IIR Maverick
C-141 Stretch
Landing Control TPN-19
Precision Location Strike SPO
C-5A Mod
EF-111A
ALCM
DSCS III

NAVY PROGRAMS

S-3A ASW Aircraft
Trident
FLTSATCOM
AN/BQQ-5
Joint Cruise Missile
NATO PHM
Low Cost EW
Surface Systems Gun

SURTASS

DD-963

AEGIS

SSN-688

SOSUS

LAMPS

HARM

CAPTOR

CM-53E

TACTAS

E-2C

LHA

F-14

CIWS

FFG-7

DDG-47

F-18

Harpoon

APPENDIX C

OPEN-ENDED RESPONSES TO SURVEY QUESTION 21--
PROBLEMS AND SUGGESTIONS NOT COVERED
IN THE QUESTIONNAIRE

The 36 responses that did not duplicate variables covered in the questionnaire were categorized as follows:

1. Concepts expressing the belief that contractors can make unfair gains through the Value Engineering clauses (N=5).

Examples:

- (a) Contractors submit VECP's instead of ECP with cost considerations.
- (b) Contractors use VECP's to develop new technology; cost savings in proposal disappear in negotiation.

2. Concepts expressing the belief that government employees do not evaluate VECP's fairly or are too suspicious of contractors (N=8).

Examples:

- (a) VE changes are invalidated by later design changes.
- (b) Negative attitudes toward VE by government personnel kill many good VECP's.

3. Value Engineering conflicts with Design to Cost, Life Cycle Cost, or other cost reduction techniques (N=7).

Example:

VECP's should be evaluated in terms of Life Cycle Cost (N=3).

4. Value Engineering is not sufficiently integrated in the total acquisition process (N=4).

Examples:

- (a) VE should be integrated into the program and not be a separate entity.
- (b) VE in full scale development only tracks the engineering design effort; it should be an integral part of the design effort.

5. Continued high level DoD emphasis is needed (N=3).

Examples:

- (a) Contractors perceive VE as another "buzz word"; here today, gone tomorrow. They will do minimum to help the Government fill a square, then let it fade away.
- (b) More emphasis needed from high level government and industry personnel.

6. Miscellaneous (N=9)

Examples:

- (a) There should be more attention to end item savings.
- (b) Need more face to face communications between contractor and government personnel to resolve problems.

(c) VECF's do not identify all costs associated with the proposals.

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BIOGRAPHICAL SKETCHES

BIOGRAPHICAL SKETCHES

Mr. Cook graduated from Case Western Reserve University (BA) and The Ohio State University (MA). He was hired in 1974 as an FSEE trainee. He has worked in the contract administration, services, and supplies purchasing sections of base procurement, 2750th ABW Procurement Division. His next assignment after graduation will be as Chief, Services and Supplies section, Base Contract Administration Branch, 2750th ABW Procurement Division, Wright-Patterson AFB, Ohio.

Captain Sheldon was commissioned in 1971 after graduation with a Bachelor of Science degree from Ball State University. His past service includes assignments in MAC and Headquarters Command in the administrative career field. Captain Sheldon came to AFIT following four years of Alaskan duty with the Armed Forces Courier Service. His next assignment after graduation will be as Chief, Subcontract Management at the TRW Air Force Plant Representative Office in Redondo Beach, California.